

3mm Size Chip Trimmer Potentiometer

Details

Product No.	Resistance element	Size	Adjusting direction	Total Resistance	Adjusting method	Soldering	Packing style	Minimum packing unit (pcs.)
RH03AVA14X	Cermet	3mm	Side	10k Ω	Manual	Reflow	Brister taping	400

Products Specifications

Operating temperature range	Tolerance of nominal total resistance	Rated power and maximum operating voltage	Resistance taper
-40° C to +100° C	$\pm 25\%$	0.2W, 50V at 70° C	B linear

Residual resistance	Slider noise	Ineffective variable range at both ends
2% max.	5% max. (JIS C 5261 5.8B)	10% max.

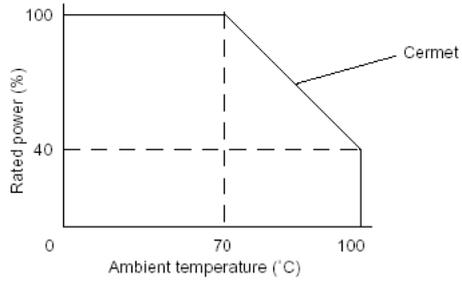
Effective rotational angle	Rotational torque	Stopper strength	Rotational life	Rotational life
				Variation in total resistance
250 \pm 20°	2 to 20mN·m	Endless	20 turn	$\pm 10\%$

Long-term heat resistance	Long-term heat resistance	Moisture resistance	Moisture resistance	Loading in damp atmosphere	Loading in damp atmosphere
	Variation in total resistance		Variation in total resistance		Variation in total resistance
100 \pm 2° C, 500 \pm 12h, 1.5h at nominal temperature and humidity	$\pm 5\%$	40 \pm 2° C, 90 to 95%RH, 500 \pm 12h, 1.5h at nominal temperature and humidity	$\pm 5\%$	40 \pm 2° C, 90 to 95%RH, 500 \pm 12h, 5h at nominal temperature and humidity	$\pm 4\%$

Operating life with load	Operating life with load	Solder heat resistance			Solder heat resistance	Temperature coefficient of resistance
	Variation in total resistance	Manual soldering	Dip soldering	Reflow soldering	Variation in total resistance	
70 \pm 3° C, 1000 \pm 12h, 1h at nominal temperature and humidity	$\pm 5\%$	270° C max. 3s max.	-	240° C max. 10s max.	$\pm 2\%$	-20° C to +100° C $\pm 300\text{ppm}/^\circ\text{C}$

1. Place your purchase order in N minimum package units (N: integer).
2. Ask us for the export packaging unit.
3. Please contact us for the recommended cleaning agents.
4. Ratings Power

The curve shall be used when the ambient temperature exceeds 70° C.



5. This products can be used in vehicles.

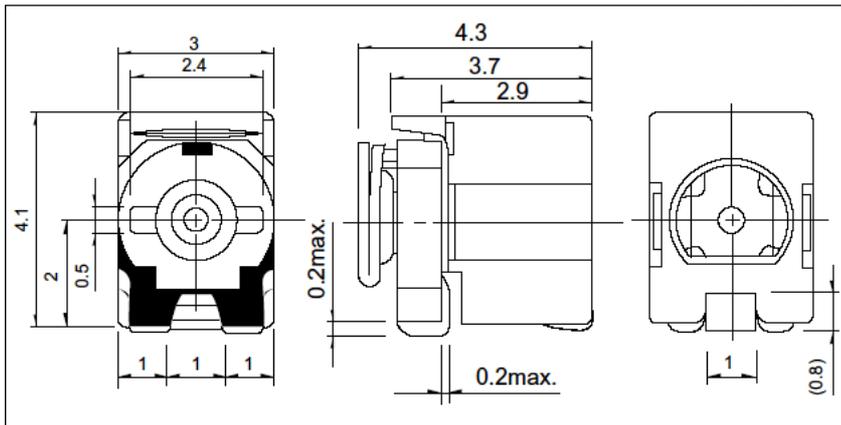
Although these products are designed to perform over a wide operating temperature range, please ensure that you receive and read the formal delivery specifications before use.

Appearance



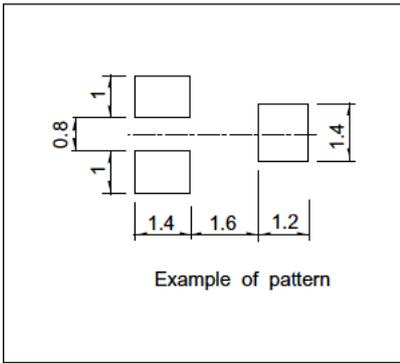
Dimensions

Unit : mm

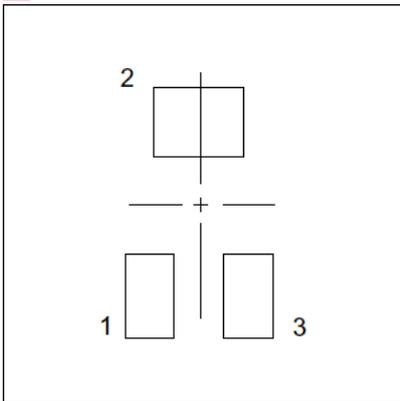


■ PC board Land Dimensions

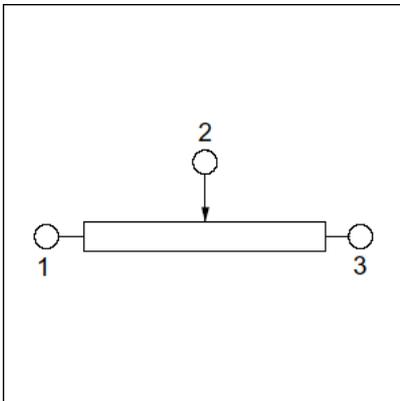
Unit : mm



■ Terminals Layout



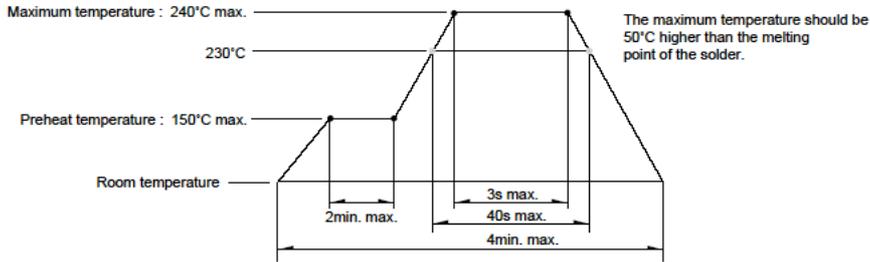
■ Circuit Diagram



Soldering Conditions

(1) Reflow soldering

The products can be flow-soldered under the following conditions.



(2) Manual soldering

The products can be soldered manually at a temperature of 350° C max, within 3 seconds.

Notes

For lead-free models, consult with us individually.

Resistance Value Variety

Nonstandard Value of Resistance

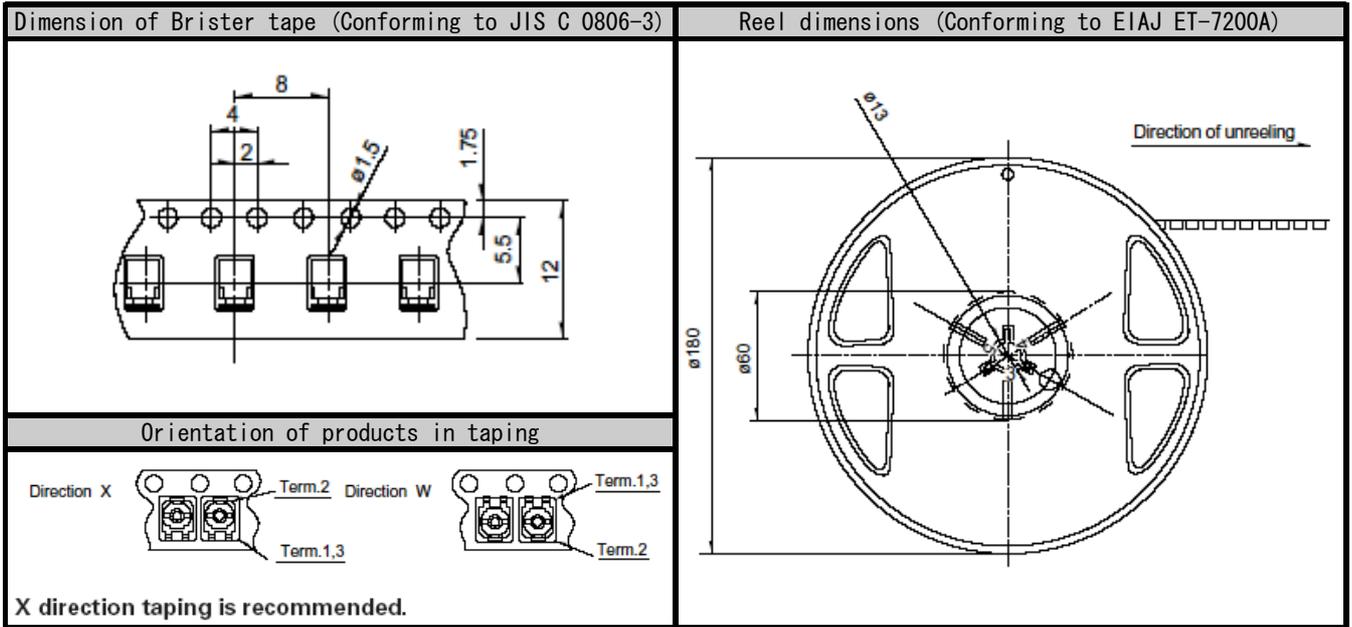
In spite of our recommendation for the total resistance listed above, the following resistance values are also available as nonstandard ones.

The area marked by the shows our recommended resistance value. Other resistance values are treated as non-standard specifications.

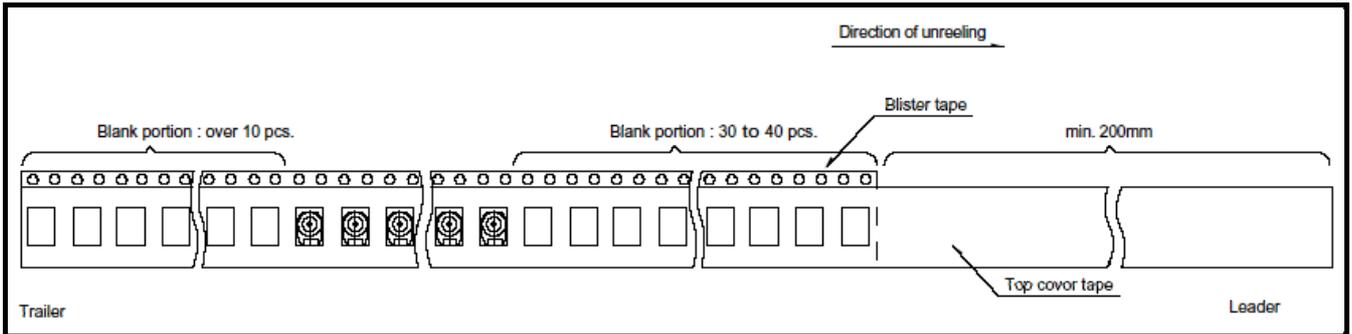
Total resistance (Ω)	100	220	470	1k	2.2k	4.7k	10k	22k	47k	100k	220k	470k	1M	2.2M
RH03ADC	12X	J2X	S2X	13X	J3X	S3X	14X	J4X	S4X	15X	J5X	S5X	16X	J6X
RH03AXA	12X	J2X	S2X	13X	J3X	S3X	14X	J4X	S4X	15X	J5X	S5X	16X	J6X
RH03APA	12X	J2X	S2X	13X	J3X	S3X	14X	J4X	S4X	15X	J5X	S5X	16X	J6X
RH03AVA	12X	J2X	S2X	13X	J3X	S3X	14X	J4X	S4X	15X	J5X	S5X	16X	J6X
Total resistance (Ω)	150	330	680	1.5k	3.3k	6.8k	15k	33k	68k	150k	330k	680k	1.5M	
RH03ADC	E2X	N2X	W2X	E3X	N3X	W3X	E4X	N4X	W4X	E5X	N5X	W5X	E6X	
RH03AXA	E2X	N2X	W2X	E3X	N3X	W3X	E4X	N4X	W4X	E5X	N5X	W5X	E6X	
RH03APA	E2X	N2X	W2X	E3X	N3X	W3X	E4X	N4X	W4X	E5X	N5X	W5X	E6X	
RH03AVA	E2X	N2X	W2X	E3X	N3X	W3X	E4X	N4X	W4X	E5X	N5X	W5X	E6X	

■ Brister Taping Specifications

Unit : mm



Roaling of Tape Package



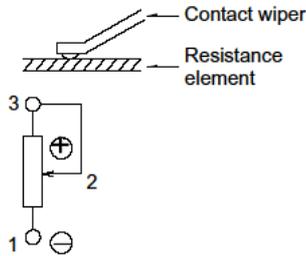
■ Recommended Adjusting Driver

Model	Maker	Product name, Model number		Tip shape	Bit material	Adjustment method
RH03AXA	Toray Industries, Inc.	TORYCERAM Adjuster	ALS-3001	Regular screw driver	Ceramic	Manual adjustment
RH03APA						
RH03AVA						

■ Caution

[Terminal Connections]

In applications where a direct current is allowed to flow through the potentiometer's sliding arm, there could be a problem of anodic oxidation due to an unusual increase in resistance value. In this case, it is recommended that you connect the negative line to the resistance element and the positive line to the sliding arm.



[Dew Condensation]

Avoid using the potentiometer where dew or water drops might occur on the surface of the resistor, etc. Deterioration of insulation or shorting may occur.

[Stress Being Applied to the Terminals]

Always pay special attention not to apply excessive stress when handling the terminals. Also, be sure to design appropriate soldering conditions.

[Washing]

Cleaning after soldering is recommended. Flux and solder that adhere to the surface of the resistor and the contact point of sliding may reduce the product's performance.

[Rotation Stopper]

(1) Non-rotation stopper type

When the shaft is turned beyond the effective rotational angle, the circuit between the two terminals will be open. If there is a possibility that the IC or other devices may be damaged by this open circuitry, provide a protective circuit.

(2) Rotation stopper type

When the shaft is turned by a force exceeding the specifications, the rotation stopper may break. When this occurs, the slide portion may be deformed or malfunction due to friction may occur.

[Storage Condition]

(1) Keep the product in an atmosphere free of corrosive gases.

(2) Please use the product within 6 months after delivery.

The above operation notes are quoted from the

"Precaution and Guideline of Potentiometer for Electrical Devices", which is a technical report issued by the Electronic Industries Association of Japan RCR 2191(in July 1994).

For details, see the above technical report.

■ Measurement and Test Methods

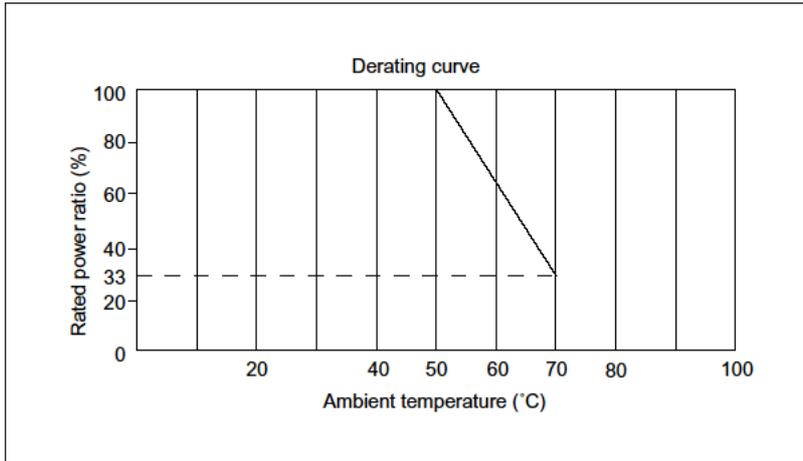
Electrical performance

[Total Resistance]

With the shaft (lever) placed at the termination of terminal 1 or 3, total resistance shall be determined by measuring the resistance between the resistor terminals 1 and 3 unless otherwise specified.

[Rated Power]

Rated power shall be the maximum value of electric power that can be applied continuously to the whole area of a resistor (between terminals 1 and 3) at the rated ambient temperature. The rated ambient temperature of a carbon film resistor shall be 50° C. The maximum power at an ambient temperature of 50 to 70° C shall be obtained by multiplying the rated power by the rated power ratio determined from the derating curve shown below.



[Rated Voltage]

Rated voltage is associated with the rated power and shall be determined by the following equation. When the resulting rated voltage exceeds the maximum operating voltage of a specific resistor, the maximum operating voltage shall be taken as the rated voltage.

$E = \sqrt{P \cdot R}$
E : rated voltage (V)
P : rated power (W)
R : total nominal resistance (Ω)

[Residual Resistance]

With the shaft (lever) placed at the termination of terminal 1, the resistance shall be measured between the terminals 1 and 2. Next, with the shaft (lever) placed at the end of terminal 3, the resistance shall be measured between the terminals 2 and 3. If there are tap terminals, the shaft (lever) shall be turned (moved) and the resulting minimum resistance between the tap terminal and the terminal 2 shall be measured.

[Sliding Noise]

Measured by connecting the resistor to an amplifier having frequency characteristics specified in JIS C 6443, applying DC voltage of 20V between the terminals 1 and 3 (if rated voltage is 20V or less, this voltage shall be applied) and by rotating (moving) the shaft (lever) at a speed of about 30 cycles per minute.

[Voltage Withstand]

Determined by applying AC voltage to the specified locations for one minute to checking for arc, burning, dielectric breakdown and other abnormalities. Respective terminals may be tested together. The locations described below shall be tested unless otherwise specified. However, if the section concerned is so constructed as to conduct, that particular part shall not be tested.

[Insulation Resistance]

Measured with a megger by applying specified voltage to the specified locations. The locations below shall be tested unless otherwise specified. However, if the section concerned is so constructed as to conduct, that particular part shall not be tested.

[Measuring Locations For Withstand Voltage and Insulation Resistance]

- Between terminal and shaft (lever)
- Between terminal and metal cover (frame)
- Between terminals connected to separate resistor element and terminal connected to another resistor element (of multi-ganged-unit)
- Between switch terminal and shaft
- Between switch terminal and resistance terminal
- Between switch terminal and metal cover

Mechanical Performance

[Total Rotational Angle (Travel)]

Determined by measuring the rotational angle (travel) when the shaft (lever) is turned (moved) from the termination position of terminal 1 to the termination position of terminal 3.

[Rotational Torque (Operating Force)]

Determined by measuring the torque (operating force) necessary to turn (move) the shaft (lever). Unless otherwise specified, measurement shall be made at an ambient temperature of 5 to 35° C, and the shaft rotational speed shall be 60° per second and the lever moving speed 20mm per second.

[Allowable Operating Torque for Shaft (Leer)]

With the shaft (lever) placed at the termination of terminal 1, a specified torsional moment (force) shall be applied in that direction for 10 seconds. Next, the shaft (lever) shall be placed at the termination of terminal 3 and a specified torsional moment (force) shall be applied similarly, to check the control part and other related sections for any deformation or breakage.

[Push-pull Strenght (Lever Push-pull Strenght)]

A specified force shall be applied in the axial direction of the shaft (lever) for 10 seconds to check the control part and other sections for any deformation or breakage and for operating condition.

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